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ABSTRACT OF THE DISCLOSURE

An ablative composition and methods of forming ablative structures are provided that improve char during ablation, prevent combustion during ablation, and which reduce moisture absorption of low temperature ablative (LTA) materials. The ablative composition comprises an intumescent material such as ammonium polyphosphate (APP) that is disposed within an LTA material at the outer surface of the ablative composition. The intumescent material may also be added in increasing amounts throughout the LTA material such that a gradient of intumescent material is formed near the outer surface of the ablative composition for the required amount of thermal protection. Both the LTA material and the intumescent material are applied to a substrate, or an aerospace vehicle structure, preferably in layers using methods such as spray forming or hand troweling.

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